

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A reflective film for adhesion to a construction material, which reflective film comprises a layer of converter grade Aluminum foil having a thickness of between about 0.00025 mil and about 2 mil adhered to one surface of a polymer film or film composite, said polymer film or film composite having a surface energy of at least 35 dynes and consisting of:
 - (a) a first outer portion suitable for adhesion to the construction material consisting of one or more layers of:
 - (i) a metallocene-catalyzed polyethylene with density below 0.907 g/cm³ and a melt index between 0.5 and 30 g/10 min;
 - (ii) an ethylene vinyl acetate copolymer (EVA) having a vinyl acetate content between 2 and 30% and a melt index between 0.5 and 30 g/10 min;
 - (iii) an acid/acrylate or anhydride modified ethylene vinyl acetate copolymer having a melt index between 0.5 and 30 g/10 min;
 - (iv) an acid or anhydride modified ethylene acrylate copolymer having a melt index between 0.5 and 30 g/10 min;
 - (v) an ethylene butyl-, ethyl- or methyl-acrylate copolymer (EBA, EEA or EMA) having a melt index between 0.5 and 30 g/10 min;
 - (vi) a terpolymer of ethylene, butyl-acrylate and glycidylmethacrylate (E/nBA/GMA) having a melt index between 0.5 and 30 g/10 min;
 - (vii) an ethylene acrylic acid and methacrylic acid copolymer having a melt index between 0.5 and 30 g/10 min;
 - (viii) an ionomer of ethylene, methacrylic acid (E/MAA) having a melt index between 0.5 and 30 g/10 min;

- (ix) a maleic anhydride grafted polyethylene or ethylene copolymer having a melt index between 0.5 and 30 g/10 min;
- (x) a combination of one or more of (i), (ii), (iii), (iv), (v), (vi), (vii), (viii), or (ix),

alone or blended with between 0 and 80% low density polyethylene or linear low density polyethylene having a melt index between 0.3 and 30 g/10 min; and

- (b) a second outer portion adhered to the layer of Aluminum foil and consisting of one or more layers of:
 - (i) an ethylene acrylic acid and methacrylic acid copolymer having a melt index between 0.5 and 30 g/10 min;
 - (ii) an ionomer of ethylene, methacrylic acid (E/MAA) having a melt index between 0.5 and 30 g/10 min;
 - (iii) a maleic anhydride grafted polyethylene or ethylene copolymer having a melt index between 0.5 and 30 g/10 min;
 - (iv) a low density polyethylene having a melt index between 0.3 and 30 g/10 min; or
 - (v) a combination of one or more of (i), (ii), (iii) or (iv).

2. A reflective film for adhesion to a construction material, which reflective film comprises a layer of converter grade Aluminum foil having a thickness of between about 0.00025 mil and about 2 mil adhered to one surface of a polymer film or film composite, said polymer film or film composite having a surface energy of at least 35 dynes and consisting of:

- (a) a first outer portion suitable for adhesion to the construction material consisting of one or more layers of linear low density polyethylene having a melt index between 0.3 and 30 g/10 min alone or blended with between 0 and 80% low density polyethylene; and

- (b) a second outer portion adhered to the layer of Aluminum foil and consisting of one or more layers of:
- (i) an ethylene acrylic acid and methacrylic acid copolymer having a melt index between 0.5 and 30 g/10 min;
 - (ii) an ionomer of ethylene, methacrylic acid (E/MAA) having a melt index between 0.5 and 30 g/10 min;
 - (iii) a maleic anhydride grafted polyethylene or ethylene copolymer having a melt index between 0.5 and 30 g/10 min;
 - (iv) a low density polyethylene having a melt index between 0.3 and 30 g/10 min; or
 - (v) a combination of one or more of (i), (ii), (iii) or (iv).
3. The reflective film according to claim 1 or 2, which comprises a polymer film that additionally includes a middle portion consisting of one or more layers of:
- (i) a low density polyethylene with a melt index between 0.3 and 30 g/10min;
 - (ii) a linear low density polyethylene with a density below 0.930 g/cm³ and melt index between 0.3 and 30 g/10min;
 - (iii) a polyethylene with a density above 0.930 g/cm³ and melt index between 0.3 and 30 g/10min;
 - (iv) an ethylene vinyl acetate copolymer having a vinyl acetate content between 2 and 30 % and a melt index between 0.5 and 30 g/10min;
 - (v) a polypropylene;
 - (vi) any combination of two or more of (i), (ii), (iii), (iv) or (v).
4. The reflective film according to claim 3, wherein the middle layer is formulated to provide heat resistance.

5. The reflective film according to claim 4, wherein the middle layer additionally comprises high density polyethylene or polypropylene resin.
6. The reflective film according to claim 1 or 2, which comprises a polymer film composite that additionally includes a middle portion consisting of one or more layers of kraft paper.
7. The reflective film according to any one of claims 1 – 6, wherein one or more layers of the polymer film or film composite additionally comprises a slip agent or an anti-block agent.
8. The reflective film according to any one of claims 1 – 7, wherein both of the outer surfaces of the polymer film or film composite are corona, ozone or flame treated in order to obtain the surface energy of at least 35 dynes.
9. The reflective film according to any one of claims 1 – 8, wherein the layer of Aluminum foil is adhered to the polymer film or film composite via extrusion laminating of the film to the foil.
10. The reflective film according to any one of claims 1 – 8, wherein the layer of Aluminum foil is adhered to the polymer film or film composite using a heat and pressure laminator and a method comprising annealing, heating and pressing the film onto the foil and cooling the resultant reflective film.
11. The reflective film according to any one of claims 1 – 8, wherein the layer of Aluminum foil is adhered to the polymer film or film composite using a solvent or solvent-free lamination system using an adhesive.
12. The reflective film according to any one of claims 1 – 8, wherein the layer of Aluminum foil is adhered to the polymer film or film composite using a thermal, UV or E-beam curable adhesive and/or an epoxy- or polyurethane-based adhesive.
13. The reflective film according to any one of claims 1 – 8, wherein the layer of Aluminum foil is sprayed with a light coating of primer and cured before being adhered to the polymer film or film composite.

14. The reflective film according to any one of claims 1 – 13, wherein the layer of Aluminum foil has a plurality of perforations therethrough.
15. A composite material comprising the reflective film according to any one of claims 1 – 14 laminated to one side of a construction material, wherein the polymer film or film composite is directly adhered to the construction material such that the layer of Aluminum foil forms a surface of the composite material.
16. The composite material according to claim 15, wherein the construction material is an oriented strand board, a lumber based product, a fibreboard or a structural or non-structural plastic.
17. The composite material according to claim 15 or 16, wherein the reflective film is thermo-laminated to the construction material using heat and pressure.
18. A method of manufacturing a composite material comprising the step of thermo-laminating the reflective film according to any one of claims 1 – 14 to one side of a construction material such that the layer of Aluminum foil forms a surface of the composite material.
19. The method according to claim 18, wherein the construction material is an oriented strand board, a lumber based product, a fibreboard or a structural or non-structural plastic.